



Homework 4 Subroutines

1. Describe briefly **three** advantages of using subroutines in programs. [6]

2. (a) What is a global variable? [1]

(b) What is a local variable? [1]

(c) What is the advantage of using local variables in subroutines? [2]

3. Write a program in pseudocode that allows the user to add a name to a list array that holds up to ten names. The main program should call a subroutine that presents the user with a menu of three choices:

- 1 Add name
- 2 Display list
- 3 Quit

The subroutine accepts and validates the user choice (1-3). If it is invalid, an appropriate error message should be displayed and the user asked to re-enter until they input a valid choice.

The subroutine is called with the statement

```
choice = displayMenu()
```



The main program then branches to one of two subroutines which adds a name or displays the list, or quits the program with a message "Program terminating" if the user selects option 3.

If the user chooses to add a name, they should be prompted to enter a list number indicating where they want the name to be inserted. If the location is occupied, it will overwrite the name.

The program will also provide an option to display the list. The output should look something like the example below. [10]

```
1. Add name
2. Display list
3. Quit

Enter your choice: 4
Invalid choice - please re-enter: 1
Enter the name to be added to the list
Joe
Enter the position in the list to insert the name (1-10):
3

1. Add name
2. Display list
3. Quit

Enter your choice: 2
3 Joe

1. Add name
2. Display list
3. Quit

Enter your choice: 3

Program terminating
```

[Total 20 marks]